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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/190,207	11/13/1998	JIASHU CHEN	CHEN-4	6396

7590 04/24/2002

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EXAMINER
RAY, LONNIE L

ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 04/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/190,207	CHEN, JIASHU	
	Examiner	Art Unit	
	Lonnie L. Ray, Jr	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 - 12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 - 12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al.(5,500,900).

Consider claim 1. Chen et al. teach a head-related transfer function model for use with 3D sound applications, comprising:

(a). A plurality of Eigen filters (fig 5a, #42 & 43);

(b). A plurality of spatial characteristic functions are adaptively combined with said plurality of Eigen filters (fig 5a, #106 & 107); and

(c). A plurality of regularizing models (the spline model, col 5, lines 66 – 67 through col 6, lines 1 –5) adapted to regularize said plurality of spatial characteristic (fig 5a, #107 & 108) functions prior to said respective combination with said plurality of Eigen filters (fig 5a, #51 & 52). The spline method explain that the regularizing is done in the STCF's and FETF's measurements (col 5, lines 18 – 43).

Consider claim 2. Chen et al. teach the head-related transfer function model for use with 3D sound applications according to claim 1, further comprising:
A summer (fig 5a, # 80 & 81) operably coupled to said plurality of combined Eigen filters combined with said plurality of regularized spatial characteristic functions to provide said head-related transfer function model (fig 5a, #51 and 52)

Consider claim 3. Chen et al. teach the head-related transfer function model for use with 3D sound applications according to claim 1, wherein:

Said plurality of regularizing models are each adapted to perform a generalized spline model (col 5, lines 66 – 67 through col 6, lines 1 –5). The spline method explain that the regularizing is done in the STCF's and FETF's measurements (col 5, lines18 – 43.

Consider claim 4. Chen et al. teach the head-related transfer function model for use with 3D sound applications according to claim 1, further comprising:

A smoothness control operably coupled with said plurality of regularizing models to allow control of a trade-off between localization and smoothness of said head-related transfer function (col 5, lines 27 - 43).

Consider claim 5. Chen et al. teach a head-related impulse response model for use with 3D sound applications, comprising:

A plurality of Eigen filters (fig 5a, # 51 & 52);

A plurality of spatial characteristic functions are adapted to be respectively combined with said plurality of Eigen filters (fig 5a, #106 & 107); and

A plurality of regularizing models adapted to regularize said plurality of spatial characteristic functions (fig 5a, #106 & 107) prior to said respective combination with said plurality of Eigen filters (fig 5a, #51 & 52). (The ref for this claim is in col 5, lines 29 – 43)

Consider claim 6. Chen et al. teach the head-related impulse response model for use with 3D sound applications according to claim 5, further comprising:

A summer adapted to sum said plurality of combined Eigen filters combined with said plurality of regularized spatial characteristic functions to provide said head-related impulse response model (fig 5a, # 80 & 81).

Consider claim 7. Chen et al. teach the head-related impulse response model for use with 3D sound applications according to claim 5, wherein:

Said plurality of regularizing models are each adapted to perform a generalized spline model (spline model explained at col 5, lines 1 –43).

Consider claim 8. Chen et al. teach the head-rerlated transfer function model for use with 3D sound applications according to claim 5, further comprising:

A smoothness control in communication with said plurality of regularizing models to allow control of a trade-off between localization and smoothness of said head-related transfer function (col 5, lines 28 - 33).

Consider claim 9. Chen et al. teach a method of determining spatial characteristic sets for use in a head-related transfer function model, comprising:

Constructing a covariance data matrix of a plurality of measured head-related transfer functions (col 4, lines 40 – 67);

Performing an Eigen decomposition of said covariance data matrix to provide a plurality of Eigen vectors (col 4, lines 14 – 40);

Determining at least one principal Eigen vector from said plurality of Eigen vectors (col 6, lines 14 – 49).; and

Projecting said measured head-related transfer functions back to said at least one principal Eigen vector to create said spatial characteristic sets (col 5 & 6, lines 56 – 67 and 1 – 23).

Consider claim10. Chen et al. teach a method of determining spatial characteristic sets for use in a head-related impulse response model, comprising:

Constructing a covariance data matrix of a plurality of measured head-related impulse responses (col 4, lines 40 – 67);

Performing an Eigen decomposition of said covariance data matrix to provide a plurality of Eigen vectors (col 4, lines 14 – 40);

Determining at least one principal Eigen vector from said plurality of Eigen vectors (col 6, lines 14 – 49); and

Back-projecting said measured head-related impulse responses to said at least one principal Eigen vector to create said spatial characteristic sets (col 5 & 6, lines 56 – 67 and 1- 23).

Consider claim 11. Chen et al. teach that the apparatus for determining spatial characteristic sets for use in a head-related transfer function model, comprising:

means for constructing a covariance data matrix of a plurality of measured head-related transfer functions (col 4, lines 40 – 67);

Means for performing an Eigen decomposition of said covariance data matrix to provide a plurality of Eigen vectors (col 4, lines 14 – 40);

Means for determining at least one principal Eigen vector

from said plurality of Eigen vectors (col 6, lines 14 – 49); and

Means for back-projecting said measured head-related transfer functions to said at least one principal Eigen vector to create said spatial characteristic sets (col 5 & 6, lines 56 – 67 and 1 – 23).

Consider claim 12. Chen et al. teach apparatus for determining spatial characteristic sets for use in a head-related impulse response model, comprising:

Means for constructing a covariance data matrix of a plurality of measured head-related impulse responses (col 4, lines 40 – 67);

Means for performing an Eigen decomposition of said covariance data matrix to provide a plurality of Eigen vectors (col 4, lines 14 – 40);

Means for determining at least one principal Eigen vector from said plurality of Eigen vectors (col 6, lines 14 – 49); and

Means for back-projecting said measured head-related impulse responses to said at least one principal Eigen vector to create said spatial characteristic sets (col 5 & 6, lines 56 – 67 and 1 – 23).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lonnie Ray, whose telephone number is (703)305 – 3279).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor can be reach on (703) 305-4708.

Any response to this action should be mail to:

Commissioner of Patents and Trademarks

Washington, D. C. 20231

or fax to:

(703) 308 – 6306 or (703) 308 – 6296 (Group's Fax Numbers)

Hand delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, Virginia, Sixth Floor (Receptionist).

SINH TRAN
PRIMARY EXAMINER